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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/824,032	04/14/2004	Chunxin Ji	8540G-000206	6024
27572	7590	07/11/2006	EXAMINER	
HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 828 BLOOMFIELD HILLS, MI 48303			JOLLEY, KIRSTEN	
			ART UNIT	PAPER NUMBER
			1762	
DATE MAILED: 07/11/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.		Applicant(s)	
	10/824,032		JI ET AL.	
	Examiner		Art Unit	
	Kirsten C. Jolley		1762	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 11-27 and 31-36 is/are rejected.
- 7) ☒ Claim(s) 10 and 28-30 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/14/04</u> . | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-4, 6-9, 11-27, and 31-36 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for polytetrafluoroethylene and other polymers that will settle out of an emulsion or precipitate out of a solution under evaporating conditions, does not reasonably provide enablement for *all polymers* as claimed in claims 20-27, 31, and 35-36, or *all hydrophobic polymers* as claimed in claims 1-3, 6-8, and 32-34, or *all fluorocarbon polymers* as claimed in claims 4, 9, and 11-19. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. It is the Examiner's position that not all polymers, or all hydrophobic polymers, etc., would be capable of moving with the solvent during drying such that the polymer particles settle down at the place where the solvent evaporates (i.e., in the pattern openings), as is the inventive concept of the instant application. Further, Applicant's own specification discloses in paragraph [0030] that "The polymer used in the invention and deposited on the sheet material by the methods of the invention is one that will settle out of an emulsion or precipitate out of a solution under the evaporating conditions described below."

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1, 4-6, 20, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Hedge et al. (US 6,395,325).

Hedge et al. discloses a method for depositing a hydrophobic polymer on a porous sheet material in a predetermined pattern comprising the steps of: wetting the porous sheet material with a polymer composition comprising solvent and hydrophobic polymer; contacting the wet porous sheet material with a pattern member containing openings corresponding to the predetermined pattern; and drying (by evaporating solvent) the wet porous material while in contact with the pattern member (see col. 12, lines 47-63 and col. 13, lines 10-18). Hedge et al. teaches that the mask is removed after drying the hydrophobic polymer solution on the porous membrane substrate. It is noted that the porous membrane of Hedge et al. may be a diffusion media. As to claim 36, Hedge et al.'s process results in a varied polymer loading on the sheet corresponding to the pattern member.

As to claims ⁴⁻⁵~~3-4~~, Hedge et al. teaches that the hydrophobic polymer may be PTFE (col. 7, lines 18-28).

Claim Rejections - 35 USC § 102/103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 19 and 31-35 are rejected under 35 U.S.C. 102(e) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Mathias et al. (US 2004/0137311).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

The process of Mathias et al. results in a fuel cell gas diffusion layer having a pattern of hydrophobic regions and hydrophilic regions (paragraphs [0031]-[0035]), similar to the product of the instant application. Mathias et al. teaches use of PTFE fluorocarbon hydrophobic polymer and carbon fiber paper as the diffusion media. The product must be patentable on its own merits. *In re Stephens*, 145 USPQ 656. *In re Kern*, 129 USPQ 345. The patentability of a product is based on the product limitations and not on the recited process steps. *In re Brown*, 173 USPQ 685. When the prior art discloses a product which reasonably appears to be identical with or only slightly different than a product claimed in a product by process claim, a rejection based on 102/103 is appropriate. *In re Fessmann*, 180 USPQ 324. Once the Examiner provides a

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rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983).

7. Claims 31-35 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Cisar et al. (US 2003/0068544).

The process of Cisar et al. results in a fuel cell gas diffusion media having a pattern of hydrophobic regions and hydrophilic regions (paragraphs [0043]-[0044]), similar to the product of the instant application. The product must be patentable on its own merits. *In re Stephens*, 145 USPQ 656. *In re Kern*, 129 USPQ 345. The patentability of a product is based on the product limitations and not on the recited process steps. *In re Brown*, 173 USPQ 685. When the prior art discloses a product which reasonably appears to be identical with or only slightly different than a product claimed in a product by process claim, a rejection based on 102/103 is appropriate. *In re Fessmann*, 180 USPQ 324. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983).

8. Claims 31-35 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Tetzlaff et al. (US 5,104,497).

The process of Tetzlaff et al. results in a fuel cell gas diffusion media having a pattern of hydrophobic regions and hydrophilic regions (col. 7, line 54 to col. 8, line 17), similar to the product of the instant application. Tetzlaff et al. further illustrates a plurality of lands and grooves and hydrophobic/hydrophilic treatment corresponding to the lands/grooves. The product must be patentable on its own merits. *In re Stephens*, 145 USPQ 656. *In re Kern*, 129 USPQ 345. The patentability of a product is based on the product limitations and not on the recited process steps. *In re Brown*, 173 USPQ 685. When the prior art discloses a product which reasonably appears to be identical with or only slightly different than a product claimed in a product by process claim, a rejection based on 102/103 is appropriate. *In re Fessmann*, 180 USPQ 324. Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. *In re Marosi*, 218 USPQ 289, 292 (Fed. Cir. 1983).

Claim Rejections - 35 USC § 103

9. Claims 7-8 and 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hedge et al.

As to claim 22, Hedge et al. teaches use of a mask instead of a screen to provide the pattern of hydrophobic areas. It would have been obvious for one skilled in the art to have substituted a screen for a mask with the expectation of equivalent results since screens and masks are known to be interchangeable for protecting part of a substrate during coating.

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As to claims 8 and 23-25, Hedge et al. is silent with respect to the amount of coverage of hydrophobic polymer versus hydrophilic polymer. It would have been obvious to one having ordinary skill in the art to have determined the optimum amounts of coverage of each polymer type through routine experimentation depending upon the desired porosity and end use of the membrane.

As to claims 26-27, Hedge et al. is silent with respect to the weight percent of polymer particles in its hydrophobic polymer solution. It would have been obvious to one having ordinary skill in the art to have determined the optimum amounts of polymer particles through routine experimentation depending upon the level of hydrophobicity desired, the particular materials being used, amount of coverage needed, etc., in the absence of a showing of criticality. It is well settled that determination of optimum values of cause effective variables such as these process parameters is within the skill of one practicing in the art. *In re Boesch*, 205 USPQ 215 (CCPA 1980).

Allowable Subject Matter

10. Claims 10 and 28-30 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 1st paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims. The prior art does not teach or fairly suggest a method of depositing polytetrafluoroethylene onto a sheet of carbon fiber paper in a predetermined pattern representing less than 100% coverage of the sheet comprising the steps of: wetting a sheet of carbon fiber paper with solvent and polytetrafluoroethylene; contacting the

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wet sheet with a pattern member having a predetermined pattern; and evaporating solvent from the sheet while in contact with the pattern member.

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. EP 0 846 347 B1 is cited for its teaching of a fuel cell with lands and grooves for control of reactant and product transport.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kirsten C. Jolley whose telephone number is 571-272-1421. The examiner can normally be reached on Monday to Wednesday.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on 571-272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Kirsten C Jolley
Primary Examiner
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